ADAPTATION PERFORMANCE IMPROVEMENTS FOR
ACTIVE CONTROL OF SOUND OR VIBRATION

ABSTRACT

[46]   A noise or vibration control system improves the quality of adaptation estimates by filtering the input signals to the adaptation, selectively implementing a "dead-zone" during which adaptation does not occur and by selectively adding a dither signal to the control commands. The dead-zone is based on the magnitude of the changes in the control commands, which are responding to the changes in the sensor signals. The dead-zone can be applied to all actuators simultaneously, or can be applied to the adaptation of each actuator channel independently. To maintain identifiability, a "dither signal" is added to the control commands to "ping" the system to increase the amount of information available to the adaptive algorithm. The dither signal is preferably implemented on only one actuator channel at a time. Also, the dither amplitude for each channel is preferably set to be proportional to the current control amplitude. The quality of the adaptation estimates is also improved by filtering the input signals to the adaptation circuit, $y_k = \Delta z_k$, and $v_k = \Delta u_k$. Among other things, the filter matches the filtering applied by the harmonic estimator.